

Amendment A
Application. No. 10/969,636
Page 5 of 12

REMARKS/ARGUMENTS

Claims 1-10 remain pending in the application.
Reconsideration of the pending claims in view of the
amendments above and remarks below is respectfully requested.

Turning to the specific objections and rejections:

Claim Rejections - 35 U.S.C. § 102

1. Claims 1-10 stand rejected under 35 U.S.C. § 102(b),
as being anticipated by U.S. Patent No. 4,211,694 of
Youngquist (herein the '694 patent).

The Examiner submits that the food product produced by
the process described in the '694 patent is the same as the
soy-containing cheese product of the present application
despite the Examiner's suggestion in the office action of
December 16, 2004 *that the processing limitations recited in*
the pending claims are different than the process disclosed in
*the '694 patent.*¹

Contrary to the Examiner's presumption that the products
of the '694 patent and the present application are patentably
similar, *the product produced by the process disclosed in the*
'694 patent is NOT equivalent to the product claimed in the
present application. As is detailed hereinbelow, the
differences between the process for producing the product of
the '694 patent and the process for producing the product of
the present application are significant in that the differing
processes result in dissimilar end products.

¹ See page 2 of the Office Action of December 16, 2004

Amendment A
Application. No. 10/969,636
Page 6 of 12

The process described in the '694 patent differs from the process claimed in the present application insomuch as the '694 patent teaches separation of vegetable seed particles from an aqueous deflavoring solution comprising electrolytes and carbohydrates, wherein separation is accomplished through "methods such as free draining, filtration, and centrifugation."² In comparison, the present application specifically teaches (and claims) the use of ultrafiltration for the purpose of "[removing] flavoring compounds from soy-derived materials."³ As is known in the art (and as described in the specification on page 9), ultrafiltration is a precision separation method used to remove particles measuring between 0.001 to 0.1 microns, which generally corresponds to particles having a molecular weight between 10,000 and 1,000,000 Daltons. *There is no reference in the '694 patent to ultrafiltration or elimination of particles having a specific molecular weight below 50,000 Daltons.*

The distinction between the separation procedure of the '694 patent and the present application is significant because the variant processes result in appreciably different end products. As is appreciated by a skilled artisan, employing centrifugation, free draining, or non-specific filtration (as described in the '694 patent) to separate vegetable seed particles from solution results in a non-specific assortment of particles having variable molecular weights. At best, centrifugation, free draining, or non-specific filtration may eliminate SOME of particles having a molecular weight below 50,000 Daltons (as well as SOME particles having a molecular weight above 50,000 Daltons); however, the aforementioned

² See column 7, lines 4 & 5 of the '694 patent

³ See page 9, lines 2 & 3

Amendment A
Application. No. 10/969,636
Page 7 of 12

separation techniques are not specific enough to substantially reject ALL of the compounds which cause undesirable color and flavor in seed material (as is taught and claimed by the present application). *Separation of soy protein from undesirable color and flavor compounds using an ultrafiltration membrane with a molecular weight cutoff of up to 50,000 Daltons, as claimed in the present application, is superior to the separation methods of the '694 patent because ultrafiltration recovers substantially all of the soy proteins while rejecting compounds which cause undesirable color and flavor.*⁴ The '694 patent is silent as to the molecular weight of the recovered vegetable seed material.

Thus, the cheese product of the present application contains deflavored soy protein material wherein substantially all of the components comprising the deflavored soy protein material have a molecular weight above 50,000 Daltons. Conversely, the food product of the '694 patent contains vegetable seed material garnered by non-specific separation means and, therefore, must contain significantly more molecular components below the 50,000 Dalton threshold (i.e. the molecular components responsible for negative organoleptic properties) than the cheese product of the present application. *Ultimately, the organoleptic properties of the soy-containing cheese product of the present application are superior in comparison to the food product of the '694 patent because the food product of the '694 patent incorporates a vegetable seed material containing significantly more particles having molecular weights below 50,000 Daltons than the present application (see Examples section of the present*

⁴ See page 3, lines 15-24 of the present application

Amendment A
Application. No. 10/969,636
Page 8 of 12

application).

Insofar as the soy-containing cheese product of the present application and the food product of the '694 patent differ appreciably, US Patent No. 4,211,694 fails to teach each and every limitation of independent claim 1. As claims 2-10 depend from claim 1, Applicant respectfully requests that the present rejection be withdrawn from each of claims 1-10.

2. Claims 1-10 stand rejected under 35 U.S.C. § 102(b), as being anticipated by U.S. Patent No. 4,105,803 of Peng (herein the '803 patent).

The Examiner similarly submits that the product produced by the process described in the '803 patent is the same as the soy-containing cheese product of the present application *despite* the Examiner's suggestion in the office action of December 16, 2004 that *the processing limitations taught in the pending claims are different than the process disclosed in the '803 patent.*⁵

In response, Applicants content that *the product produced by the process taught in the '803 patent is NOT equivalent to the product claimed in the present application.* Again, the differences between the process for producing the product of the '803 patent and the process for producing the product of the present application are significant in that the differing processes result in dissimilar end products.

As specified above, the present application teaches a cheese product containing deflavored soy protein prepared by passing an aqueous soy protein composition adjacent to an ultrafiltration membrane for the purpose of separating soy

⁵ See page 2 of the Office Action of December 16, 2004

Amendment A
Application. No. 10/969,636
Page 9 of 12

protein from low molecular weight compounds (i.e. below 50,000 Daltons), which are known to cause undesirable organoleptic characteristics. Further taught and claimed in the present application is the admixtion of an amount of base to the aqueous soy protein composition sufficient to solubilize the soy proteins therein (i.e. the pH is raised to the range of 9 to 12). As is described in the present application on page 11, "solubilizing the soy proteins changes their shape and in some manner results in releasing the flavoring compounds, which may be bound or encapsulated by the soy proteins when they are in a neutral or acid solution." However, as taught in the application, the use of a pH range between 9 and 12 is known not to denature proteins, whereas "a pH higher than 12 is likely to cause undesirable degradation of proteins."⁶ Thus, the process for deflavoring a soy protein mixture as taught and claimed by the present application includes releasing low molecular weight compounds into solution and then removing the low molecular weight compounds from the solution while sequestering the deflavored soy proteins.

In contrast, the '803 patent discloses mulching soybeans, recovering soybean milk, and boiling the soybean milk for 15 minutes.⁷ As is appreciated by a skilled artesian, subjecting a food source to intense heat over a prolonged period (e.g. boiling for 15 minutes) is not preferred for preserving high quality proteins. One skilled in the art recognizes that the tertiary structure of a protein is held in place by weak noncovalent chemical interactions which are easily disrupted with heat. Cleavage of the noncovalent bonds causes the protein to denature. Denatured

⁶ See page 11, lines 6-8 of the present application

⁷ See Column 6, line 63 through Column 7, line 37 of the '803 patent

Amendment A
Application. No. 10/969,636
Page 10 of 12

proteins have a lower bioavailability than native proteins in their tertiary structure, thus negatively affecting overall nutritional quality.

The process for releasing low molecular weight compounds which are responsible for undesirable organoleptic properties in food products disclosed in the present application is superior to the methods taught by the '803 patent as the process described in the present application maintains protein integrity while the process of the '803 patent causes denaturation of proteins - rendering the final food product less nutritious than the food product of the present application.

Furthermore, the '803 patent does not teach a precise separation technique for substantially eliminating ALL of the compounds which cause undesirable color, flavor, and odor in seed material (as is taught and claimed by the present application). Rather, the '803 patent uses heat for "destroying trypsin inhibitor, and inactivating lipoxygenase, which otherwise may cause rancidity and off-flavor in the resultant soybean products."⁸ In contrast, the present application teaches the elimination of numerous chemical compounds known to cause undesirable color, flavor, and odor in soy including phytates, 1-pentanol, 2-ethylpenol, 1-nitropentane, etc. (see Table C in Example 10 of the present application for a more complete listing). Thus, the '803 patent does not teach a method for eliminating the multitude of objectionable compounds having a molecular weight below 50,000 Daltons as taught by the present application. *Thus, the cheese product of the present application is different*

⁸ See Column 6, lines 26-29 of the '803 patent

Amendment A
Application. No. 10/969,636
Page 11 of 12

than the food product of the '803 patent because the cheese product of the present application contains a deflavored soy protein material comprised of native soy proteins (not denatured by heat) and molecular components substantially limited to above 50,000 Daltons while the food product of the '803 patent contains soy material having proteins subjected to heat denaturation and a range of molecular components beginning at below 50,000 Daltons. As such, the process of the present application produces a cheese product having superior nutritional properties and superior organoleptic properties in comparison to the product of the '803 patent.

Insofar as the soy-containing cheese product of the present application and the food product of the '803 patent differ appreciably, US Patent No. 4,105,803 fails to teach each and every limitation of independent claim 1. As claims 2-10 depend from claim 1, Applicant respectfully requests that the present rejection be withdrawn from each of claims 1-10.

Amendment A
Application No. 10/969,636
Page 12 of 12

CONCLUSION

By way of the remarks provided herein Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain any outstanding issues that require adverse action, it is respectfully requested that the Examiner telephone Richard Kaba at (312) 577-7000 so that such issues may be resolved as expeditiously as possible.

The Commissioner is hereby authorized to charge any additional fees which may be required by Applicants to Deposit Account No. 06-1135.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY



Julie A. Hopper
Reg. No. 50,869

Address all correspondence to:
FITCH, EVEN, TABIN & FLANNERY
Suite 1600 - 120 South LaSalle Street
Chicago, IL 60603-3406

Direct telephone inquiries to:
Richard A. Kaba
312-577-7000